BIOLOGY 341-Section 02, Spring 2016
GENERAL ECOLOGY

College of Charleston, Department of Biology, Spring 2016

Lecture: 10:30 -- 11:20 a.m. MWF; HWWE 211
Laboratory: 2:10 p.m. – 6:10 p.m. Thursday; HWEA 302
Final Exam: Monday, April 25; 8:00 a.m. – 11:00 a.m., HWWE 211
Instructor: Dr. Arch McCallum
Office: No assigned office. I use the faculty offices on 3rd floor of HWWE.
Email: mccallumd@cofc.edu
Office hours: By Appointment. After class is an especially good time.
Prerequisites: Biology 111, 112, 211

Course Description: Biologists study the natural world at many levels of a hierarchy. This course focuses on biology at the level of the whole organism and above, in the context of a planetary environment that is over-exploited by humans. What explains the abundance and distribution of different organisms? How does their abundance and distribution influence human activity? How does human activity influence their abundance and distribution? Are we in the midst of a mass extinction, and what should we do about it? How does science aid our ability to conserve biodiversity and manage our environment wisely?

Ecology embraces many aspects of the biological and physical sciences. It is truly an open-ended field of study. In this particular course we shall focus on the biology of ecology and its politics will undoubtedly creep in. We shall explore the abiotic (physical factors) of the earth that set the stage for the structure of ecosystems. Then we shall examine communities, and the fundamentals of population biology: the evolution, growth, and regulation of populations in nature, and how individual behavior produces these aggregate effects. The course will finish with the concepts of community ecology and global ecology.

Critical Thinking:

Critical thinking is the common denominator between all forms of analysis. As a "college or university student, there is no more important goal than that of developing your mind, as everything you do in your life will be affected by your mind and how it operates. The quality of your learning is affected by the quality of your thinking about learning. The quality of your personal relationships is affected by the quality of your thinking about those relationships. To take command of the thinking that controls your life, you must cultivate your intellect" (**www.criticalthinking.org**).

Course Structure: Professional biologists rely on understanding theoretical concepts and on using practical skills to develop and test those concepts. In this sense, biology is as much a way of knowing as it is a body of knowledge. This course includes two essential components – lecture and laboratory – which contribute to a single course grade (as described later in this document). Different people learn in different ways. This

course features a variety of learning activities to achieve redundancy, and hence success, in transmitting the core concerns and information of Ecology from the academic establishment to the students.

Lecture will introduce you to key concepts in all levels of ecology as well as examples of the research involved in developing and testing these concepts. The order of lecture topics follows that of the textbook. You will complete an online quiz on the reading assignment in the textbook before the lecture on the topic covered in the book. This will allow the instructor to identify topics that need special emphasis. Exams given in Lecture and Finals hours will be worth 58% of your grade. The quizzes will be worth 13% of the grade.

Laboratory has the two-fold and simultaneous function of exposing you to nature and showing you how to study it quantitatively. A few labs will be inside in a four-walled laboratory, but in most cases our laboratory will be nature. We will take field trips to all the major biomes represented in Charleston County. On many of these trips we will collect data, which will introduce you to ecological research techniques and enhance our understanding of what we are seeing. In some cases we will bring material back to campus for further analysis or study. We will also use our laboratory to master the mathematics of populations and to appreciate the role of chance in population dyanamics. You will add value to the laboratory experience by keeping a field notebook of data collected, observations made, and impressions experienced, then refining these notes as well as photographs and other media into a digital record of the entire experience. This report will be worth 14% of your grade for the course. Each unexcused absence from lab will lower your final grade by 1 point (1% of the maximum possible).

Lowcountry Natural History: There is no substitute for knowing and being able to name the species populating the environments we are studying. We are blessed to have a wide variety of biomes, both terrestrial and aquatic, within a short distance of Charleston. They include currently endangered species, and they recently included others that are now extinct. Others flourish, so the whole spectrum is here. All students at the 300 or higher level in the CofC Biology department should already be well acquainted with these species and ecosystems; for those who are not, it is now time to catch up. Accordingly, a list of approximately 200 species and ecosytems that every local Ecologist should know will be provided to all students in this course, along with access to slide shows that introduce them and provide recognition cues. Students will take a multiple-choice identification test at the end of the semester. For those who are not satisfied with their score on this test, a retest will be given at the time of the final exam. Field experience with most of these species will be acquired on Laboratory trips. This test will be worth 10% of your final grade.

Book Report. During the semester, you will obtain and read <u>one</u> of the books listed in the table below. Each is ground-breaking, mind-bending, and extremely well-written in non-technical language. If you would like to propose that another book be added to this list, write a 300-word nomination essay and email to the instructor. A 5-page (word-processed, double-spaced) analysis of your book must be submitted electronically by

Wednesday, Februay 17, 2016, at 11 p.m. for full credit. For more information on the assignment, see OAKS. This assignment is worth 5% of your grade

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Last Name	**First Name**	***Title***	**Description**
Dawkins	Richard	*The Selfish Gene*	Evolution is really about the replicators (genes) rather than the vehicles (phenotypes)
Dawkins	Richard	*The Blind Watchmaker*	Refutes William Paley's "Argument from Design" for the existence of a supernatural creator
Diamond	Jared	*Collapse*	Details why some civilizations have destroyed their life support system and others haven't.
Diamond	Jared	*Guns, Germs, and Steel*	An ecological explanation for the recent (last few centuries) dominance of Europeans in politics and business.
Harari	Yuval Noah	*Sapiens, a Brief History of Humankind*	Charts the rise of *Homo sapiens* from an evolved member of natural systems to a species that is designing its own future
Turchin	Peter	*Ultra Society*	"how 10,000 years of war made humans the greatest cooperators on earth"
Wright	Robert	*Nonzero*	How humans find win-win solutions to conflict
Wright	Robert	*The Moral Animal*	Similar to *Selfish Gene*, how moralilty is a biological adaptation
Quammen	David	*Monsters of God*	Efforts to save 4 apex predators.
Quammen	David	*Song of the Dodo*	The theory of island biogeography and conservation.
Quammen	David	*Spillover*	The role of wild nature in human epidemics called zoonoses.
Marris	Emma	*Rambunctious Garden*	A new approach to conservation. Espouses rewilding, assisted migration, and other nontraditional practices.
Earle	Sylvia	*The World is Blue*	A marine perspective on the global conservation crisis.
Barlow	Connie	*Ghosts of Evolution*	How "the mystery of the rotting fruit" inspired Dan Janzen and Paul Martin to formulate the "ecological widows" hypothesis, leading to need for assisted dispersal and migration of plant species that have lost their seed dispersers.
Levy	Sharon	*Once and Future Giants*	What megafaunal extinctions tell us about managing our remaining megafauna.
Kolbert	Elizabeth	*The Sixth Extinction*	Past mass extinctions compared to the current one.
Bolster	Jeffrey	*Mortal Sea*	pre-industrial depletion of North Atlantic fisheries in the age of sail

Course Objectives:

- Understand and practice science as a way of knowing
- Undestand the limits to growth in biological systems
- Understand how ecosystems function and sustain life on earth

- Understand the nestedness of ecological interactions, from individuals through populations and communities to ecosystems
- Be able to recognize and to classify signature species of local ecosystems and representative species from all branches of the tree of life
- Know where to find major biomes and signature species locally and on planet earth
- Know what has caused extinction of biological lineages and depauperization of local ecosystems in the past and what can be done about it in the present and future

Required Text: *Ecology,* 3rd edition. 2014. Cain, M.L., W.D. Bowman, and S.D. Hacker. Sinauer Associates.

Schedule: A spreadsheet of the tentative schedule of lectures, laboratory topics, and exam dates is posted separately on OAKS:Admin for our class.

COURSE POLICIES

Communication – Students are responsible for knowing and complying with all announcements made by the instructor during the regularly scheduled hours of Lecture and Lab. Additionally, documents needed for completing required (and optional) work will be available on OAKS. Check OAKS frequently for newly uploaded or recently revised documents. Finally, the instructor will send emails to the entire class as needed to inform students of changes of schedule, interesting seminars, materials needed for class, etc. It's a good idea to check your cofc email shortly before each class.

Lecture – <u>You are expected to attend every lecture</u>. It is very difficult to succeed in this course without regular attendance in lecture. If you must miss lecture, be sure to get help with the notes from a classmate. All students are encouraged to meet with the instructor to ask questions. It is a good idea to take notes in lecture, as writing things down lets you know if you understand. If you don't understand on the spot, raise your hand and request clarification. To assist you in this endeavor, powerpoint lectures provided by the publisher of the textbook will be provided before class. After class, slides presented in class will be provided on oaks as a pdf.

Lab – Lab is "hands-on." You will need to be on time, and present until the end of the session, to get the benefit of the exercises. Roll will be taken and an unexcused absence will result in a 1% deduction from the final grade. Learn where the parking lots are, and be sure you know which one we are using on a given day. Do not be late; but, if you are, phone 541-221-2112 and you may be able to follow along in your own vehicle.

Exams – You will be tested on lecture material and assigned readings. You are encouraged to study in groups – you will learn more if you quiz each other to test the depth of your understanding of terms and concepts.

Exams cannot be made up except in the case of a true medical emergency *suffered on the day of the exam*. Other legitimate, unavoidable conflicts (e.g., med school

interviews) are at the instructors' discretion and must be approved *well in advance*. Extracurricular activities and travel plans do not qualify – please plan accordingly. Any make-up exams must be taken before the exam is handed back to the class and no more than three days after the scheduled exam time. SNAP students are requested to make arrangements with the instructor well in advance of exams.

Hour exams will consist of multiple choice questions, questions with short written answers or fill-ins, and essay questions. Most of the multiple choice questions will have appeared on the chapter quizzes.

Computers **--** All assignments will be required to be completed on a word processor (or other necessary software (e.g. Excel saved in version MS 2010, Powerpoint MS 2010, statistical software). Submit all assignments in Microsoft Office format. If you use a different program, convert your document to a pdf. A Computer lab is available in Harbor Walk (HWWE 206) and is generally open during the day. The Biology computer lab may be reserved for classes or labs so check the door for postings. There are additional computer labs in the Addlestone library and other locations around campus.

Class Courtesies **--** Be on time, put cell phones and other devices that beep in silent mode (do not talk on the phone or text message, IM, use Facebook or conduct web searches not associated with assignments during discussion or lecture), do not eat, drink or smoke in the HWWE Laboratory, do study, do ask questions, *make class success a priority by not scheduling other appointments during class time,* be courteous to your colleagues. **Bring your enthusiasm – it is contagious. If you need to take an emergency call, please step out of the classroom to do so.**

ACADEMIC INTEGRITY

Academic integrity is important to the College of Charleston community. In addition, this course asks you to perform tasks like a professional biologist, and you will be required to uphold the standards of integrity expected in the profession. Plagiarism, lying, cheating or attempted cheating are violations of the College's honor code and will be dealt with accordingly. Please be absolutely sure that you understand what the honor code requires of you (refer to pages 10-12 of the student handbook, http://cofc.edu/generaldocuments/handbook.pdf). If you have any questions or concerns about honor code expectations or about how to avoid violations, please consult with the instructor.

Any honor code violations that occur will be handled as outlined in the student handbook.

(a) For lesser or unintentional offenses, the student will be asked to sign a form acknowledging an understanding of the mistake. This form will be kept on file by the Dean of Students, and a second such violation will automatically result in an honor court hearing.

(b) More serious cases of suspected academic dishonesty will be reported to the Dean of Students and forwarded to the honor board. Severe punishments are mandatory if found in violation of the honor code, including an XF for the course, a mark that indicates failure due to academic dishonesty.

Plagiarism: Plagiarism is any use of words or ideas produced by another person without proper attribution, and includes failing to paraphrase adequately or to cite sources properly. Whether intentional or unintentional, plagiarism is forbidden by the honor code. Please consult the instructor if you have any questions or concerns about how to use and cite sources.

Collaboration: Many of your recitation projects will involve working with other students. Nevertheless, the work you submit must be completed independently. Please be sure that you understand the distinction between collaborating and copying; ask the instructor if you have any doubts. Suspicions of copying will be dealt with according to the honor code.

Re-using work: Please be aware that re-submitting work that you or anyone else has done for this or any other class or project is a violation of the honor code, even if the work is revised. reuse or modification of such will result in referral to the Dean of Students.

ASSESSMENT

Your grade in this course will be based on the components shown below. These components will be worth the following percentages of your final grade:

Lecture		71%	
	Quizzes		13%
	Exam1		13%
	Exam2		15%
	Exam3		15%
	Final		15%
Book Report		5%	5%
Lab		24%	
	Attendance (-1% per miss)		0
	Lab Exercises and Field Notes		14%
	Taxa Test		10%
TOTAL		100%	100%

Grading policy –

A:	93.0-100.0%
A-:	90.0 - 92.9%
B+:	87.0 - 89.9%
B:	83.0 - 86.9%
B-:	80.0 - 82.9%
C+:	77.0 - 79.9%
C:	73.0 - 76.9%
C-:	70.0 - 72.9%
D+:	67.0 - 69.9%
D:	63.0 - 66.9%
D-:	60.0 - 62.9%
F:	0.0 - 59.9%

COLLEGE of CHARLESTON

SCHOOL OF SCIENCES AND MATHEMATICS

SAFETY POLICY AND PROCEDURES

The School of Sciences and Mathematics of the College of Charleston understands that the safety of our students, staff and faculty is of paramount importance. Engendering a safety culture is an important part of our mission in teaching and doing science. Each department, course of instruction, or research lab may require higher standards or procedures. The policies and procedures set forth below are understood to be minimum requirements across our departments.

In this document, the term "laboratory" is meant for a work space/facility where chemicals, biological agents, or equipment is used for research and/or instruction.

No one (student, staff, faculty, or visitor) will be allowed in a laboratory (teaching or research) to perform experiments or where experiments may be in progress unless these regulations are followed.

Students dismissed from a teaching lab due to violations of the safety procedures will not be allowed to re-enter the laboratory until authorized to do so by their supervisor (instructor) and, in the case of research laboratories, by the department chair or designee. Any course work missed because of a violation of these guidelines cannot be made up at another time (or by an extension of the lab period) and will be treated as an unexcused absence.

1. You are responsible for knowing the biological, chemical, electrical, ergonomic, mechanical, and physical hazards associated with the equipment and materials that are being utilized in the laboratory. Listen to all instructions and ask questions about that which you do not understand.

2. Know the location of safety equipment: telephones, emergency shower, eyewash, fire extinguisher, fire alarm pull.

3. Know the appropriate emergency response procedures. If there is an injury or emergency, call 953-5611.

4. Do not work alone in the laboratory if you are working with hazardous materials or equipment.

5. Use hazardous chemicals, equipment, and biological agents only as directed and for their intended purpose.

6. Do not engage in horseplay, pranks or other acts of mischief while in lab.

7. Drinking, eating, and application of cosmetics is forbidden in laboratories where chemicals or biohazards are present. Smoking is forbidden in all College buildings.

8. Appropriate personal protective equipment shall be worn. The dress code for laboratory work when using chemicals, biological or physical hazards, or when instructed to do so by the laboratory supervisor is as follows:
a) Wear safety glasses or goggles at all times.
b) No exposed skin on arms, legs or torso.
c) Wear lab coats or other approved protective garments.
d) Wear gloves or other personal protective equipment (PPE) as directed by the instructor or mandated by prudent practices based on the chemicals being handled. If in doubt, wear appropriate gloves. Latex is not permitted. Avoid cross-contamination.
e) Remove PPE (gloves and lab coat) when exiting the laboratory.
f) Wash your hands, even if gloves were used, before leaving a lab where you did any lab work.

g) Closed toe shoes are required. The heel and top of foot must be covered. High heeled shoes, sandals, and perforated shoes are not permitted.
h) Confine long hair and loose clothing.

9. Inspect equipment or apparatus for damage before adding chemical reagents or biological samples or energizing electrical equipment. Do not use damaged equipment.

10. Never remove chemicals, biological samples, or laboratory equipment from a lab without proper authorization.

11. Presume that all chemicals and biological samples used in the laboratory are hazardous for you and the environment, unless instructed otherwise.

12. Never leave an experiment unattended unless proper safety precautions are in place.

13. Read all labels on chemicals twice before using them in the lab. Read all instructions twice for the operation of any equipment or machinery.

14. Properly and safely dispose of all waste materials.

15. Treat sharps and broken glassware containers carefully.
a) Broken glass should be disposed of in properly marked safety containers. All sharps (needles, razor blades, etc.) used for any purpose must be disposed of in specially labeled SHARPS containers.
b) Do not place contaminated glass in the broken glassware container. Consult your supervisor.
c) Waste chemicals and contaminated PPE should be discarded as directed.

16. When using a reagent, replace the lid immediately. Never return unused reagents to stock bottles. Take only the amount needed for your experiment.

17. All chemicals and biological samples/media are to be disposed of in appropriately labeled containers. Specific instructions for each material will be provided. Pay attention to waste container labels before adding the material to be discarded.

18. Use good personal hygiene. Keep your hands and face clean. Wash hands thoroughly with soap and water after handling any chemical or biological agent.

19. Keep the work area clean and uncluttered with chemicals and equipment. Clean up the work area on completion of an operation or an experiment. Before leaving the laboratory, you are responsible for making sure your lab area is clean and organized.

20. Never store a chemical or biological specimen in an unlabeled container.

20. Always have your College of Charleston identification and insurance information with you when working in a laboratory. MedicAlert identification must be worn if you have any potential life-threatening chemical sensitivities or medical conditions.

21. Report any accident or injury, however minor, to your teaching assistant, instructor, or lab supervisor immediately. An accident report form must be completed and forwarded to the department chair, dean, and to the Director of Environmental Health and Safety.

If you have questions/concerns about safety in the lab please first consult your instructor. If these are not answered, please see the department chair. Finally, you may consult the director of Environmental Health and Safety, Randy Beaver at 3-6802 or beaverr@cofc.edu

Adopted: March 7, 2012

CougarAlert

The College of Charleston has an agreement with the Blackboard Connect Inc. [formerly The NTI Group, Inc. (NTI)] to use its Connect-ED communication software to provide an emergency notification system that is capable of reaching students, faculty, staff and parents within minutes of a campus crisis. This system is called **CougarAlert**.

Information for Students

The CougarAlert emergency notification system will contact up to six phone numbers for the student. Students may include family member numbers in their address and phone number information.

All students should log onto MyCharleston to review their address and telephone information and update as needed.

To access the address and telephone information, follow these steps:

1. Log on to MyCharleston
2. Click on the Academic Services tab
3. Click on the Banner Self-Service link in the third column
4. Click on the Personal Information link
5. Click on the Update Address and Phones and Cougar Alert link

The CougarAlert system will pull the phone number in the following order – cell phone with text messaging option, cell phone without text messaging option, residence hall room phone number, mailing phone number, home phone number, parent phone number and parent 2 phone number.

If you do not have one of these numbers in your student record, the system will select the next number on the list. To avoid issues related to timely communication of emergency messages to the proper places, every student must update his or her contact information in MyCharleston with current accurate information.

CougarAlert Display Information

When you receive an emergency message from the College of Charleston's CougarAlert System, the return e-mail address will be displayed as cougaralert@cofc.edu, and Caller ID will be displayed as 843.725.7246 (this is the College's Emergency Information Hotline).

Testing and Implementation

Testing will be conducted each semester to verify all systems are operating properly. The campus community will be notified via e-mail and web page postings when testing of the system will be conducted.

Blackboard Connect Software

Blackboard Connect is an emergency communication software that sends notification before, during and after an emergency. With this new system, the College will be able to communicate in many modes, including voice messages to home, work and cell phones; text messages to cell phones, PDAs and other devices; written messages to e-mail accounts; and messages to teletypewriters and telecommunication devices (TTY/TDD) for the hearing impaired. In combination with our existing communications methods and emergency response plans, this new notification system will significantly enhance the College of Charleston's ability to maintain a learning environment in which students are safe, secure and comfortable.

In an emergency, communications to the campus will be issued in the following priority order:

1. Message to the Blackboard Connect Emergency Notification System (phone and e-mail).
2. Recorded message to the College's Emergency Information Hotline, 843.725.7246.
3. Update to the Website.
4. Printed update sheets to be distributed and posted on campus (if necessary).

The CougarAlert system will only be used to notify you in the event of a campus crisis or emergency.